REMARKS

Reconsideration of this application, as amended, is requested.

Claims 1-5 remain in the application. Independent claims 1 and 3 have been amended to define the invention more clearly. New claims 6-14 have been added.

Independent claim 1 have been amended to define how the selectively operating and turning off the electromagnet is controlled in response to a deviation calculated between the determined desired rotational speed of the housing and the actual fan rotating speed. New claims 6-9 further define a valve opening-closing control signal to control the electromagnet. Support for the amendment to claim 1 and the addition to claims 6-9 can be found on at least pages 15-16 and FIG. 5-7.

Independent claim 3 have been amended to define how the operation of the electromagnet for opening the oil circulating flow passage and a turning-off of the electromagnet so that the spring material biases the valve member against the partition plate for closing the oil circulating flow passage are controlled via a fan rotating speed control signal to control the fan rotating speed so that an upper limit rotating speed is set lower than a turning-on rotating speed with respect to an optimum fan rotating speed required from the engine side during normal operation, whereby a response delay with respect to the fan rotating speed control signal of a next timing can be shortened and the associative rotation at the engine rotation changing time and the engine starting time can be reduced. New claims 10-14 further define the fan rotating speed control signal. Support for the amendment to claim 3 and the addition of claims 10-14 can be found on at least pages 17-20 and FIG. 8-14 of the instant application.

Claims 1 and 3 were objected to for the informalities listed on page 2 of the Office Action.

Claims 1 and 3 have been amended in accordance with the Examiner's helpful suggestion. It is respectfully submitted the objection to the claims should be withdrawn.

Claims 1-5 were rejected under 35 U.S.C. 112, second paragraph, as being indefinite for the reasons stated on pages 2-3 of the Office Action.

Claims 1-5 have been amended to recite "a torque transmission gap" in all instances to be consistent. It is respectfully submitted the rejection under 35 U.S.C. 112, second paragraph, is overcome.

Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martin 4,556,138 in view of Shiozaki 6,550,596 (Pub. 6/10/2002 US 2002/0003075), in further view of Watanabe 6,247,567, and still in further view of Creger 5,467,854, as set forth on pages 3-9 of the Office Action dated March 24, 2010.

The assignee does not dispute that the prior art includes many fan fluids clutches that measure various control parameters of a vehicle and use those control parameters with an electromagnet in an effort to match the fan rotation with the cooling needs of the vehicle. However, the prior art does not teach or suggest control methods of an external control type fan clutch for improving engine performance and fuel cost and improving cooling performance of the capacitor of the air conditioner (A/C) and restraining the fan noises due to the associative rotation and reducing a response delay with respect to control instructions of the fan rotation and reducing the associative rotation at the engine rotation changing time and the engine starting time and stabilizing

the fan rotating behavior as defined in the remaining claims (see page 5, line 15 - page 6, line 5).

The invention defined by the amended claims addresses these deficiencies in the admitted prior art. In particular, the amended independent claims now positively recite a step of providing a rotating shaft and drive disk fixed to the rotating shaft. The claimed method further includes providing a housing supported through a bearing of the rotating shaft. The housing has an interior and a partition plate in the housing partitions the interior of the housing into an oil reservoir chamber and a torque transmission chamber. The method further includes providing a torque transmission gap between the drive disk and the housing at locations spaced outwardly from the rotating shaft. An oil circulating flow passage is defined as extending through the partition plate inwardly of the torque transmission gap. The method further includes providing a valve member comprising a spring material and having a fixed end, a free end radially outwardly from the fixed end and aligned with the oil circulating flow passage and an armature between the fixed and free ends. An electromagnet is supported by the rotating shaft body through a bearing on the oil reservoir chamber side of the housing. The method defined by the amended claims proceeds with utilizing a spring characteristic of the spring material of the valve member for biasing the valve member against the partition plate to keep the oil circulating flow passage in a normally closed condition while keeping the valve member substantially free of magnetic forces. The method continues by detecting a plurality of signals for determining a desired rotational speed of the housing. The method continues by operating the electromagnet in response to signals indicating a need for increased rotational speed of the housing for

attracting the armature of the valve member and deflecting the valve member away from the partition plate for opening the oil circulation flow passage to permit a flow of oil through the oil circulating flow passage and radially outwardly into the torque transmission gap. The method further includes selectively turning off the electromagnet in response to signals indicative of the requirement for a slower rotational speed so that the valve member is sufficiently free of magnetic forces and biased into the normally closed condition. Independent claim 1 further defines how the selectively operating and turning off the electromagnet is controlled in response to a deviation calculated between the determined desired rotational speed of the housing and the actual fan rotating speed. Independent claim 3 further defines how the operation of the electromagnet for opening the oil circulating flow passage and a turning-off of the electromagnet so that the spring material biases the valve member against the partition plate for closing the oil circulating flow passage are controlled via a fan rotating speed control signal to control the fan rotating speed so that an upper limit rotating speed is set lower than a turning-on rotating speed with respect to an optimum fan rotating speed required from the engine side during normal operation, whereby a response delay with respect to the fan rotating speed control signal of a next timing can be shortened and the associative rotation at the engine rotation changing time and the engine starting time can be reduced.

The Martin et al. reference corresponds closely to the admitted prior art and has the deficiencies of the admitted prior art discussed above. In this regard, the electromagnet is disposed at a radially outer position and is aligned with an oil overflow hole at a radially outer position. Additionally, the electromagnet is separated from the valve member by the housing. The outer position of the electromagnet is mechanically

and dynamically unwieldy and is at a position where the electromagnet will act on a portion of the valve where fluid normally will be present. As a result, the valve will be less responsive and the Martin et al. arrangement suffers from problems of high weight and large size as described in the subject application. Furthermore, the Martin et al. method urges oil into a radially outer position on the drive disk and hence permits a flow of oil into an area of the torque transmission gap where oil will already be present due to centrifugal forces generated in the rotating housing. Hence, additional oil will flow into the torque transmission gap only by displacing the present oil in a direction opposed to the centrifugal force. Accordingly, the Martin et al. arrangement has the size, weight and performance inefficiencies described in the prior art.

As noted in the previous responses, the assignee's earlier Shiozaki et al. reference functions entirely differently, and those functional differences are very significant in the context of the method claims as amended. Furthermore, Watanabe does not use an circulation hole and a valve, but rather uses the magnet to move an entire movable disc 6 toward or away from the drive disc 4. The Creger et al. reference relates to an entirely different type of transmission. The various control parameters mentioned in Shiozaki et al., Watanabe and Creger et al. do not overcome the inherit operational inefficiencies of the method taught by Martin et al.

The references of record do not teach the method steps of amended claims 1 and 3. Hence, it is submitted that the invention defined by amended independent claims 1 and 3, along with claims depending thereform, is not taught or suggested by Martin et al. in view of Shiozaki et al., Watanabe and Creger et al.

In view of the preceding amendments and remarks, it is submitted that the invention defined by the amended claims is not taught or suggested by Martin et al. considered in view of Shiozaki et al., Watanabe and Creger et al. Accordingly, it is believed that the amended claims are directed to patentable subject matter and allowance is solicited. The Examiner is urged to contact applicant's attorney at the number below to expedite the prosecution of this application.

Respectfully submitted,

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Date: September 22, 2010